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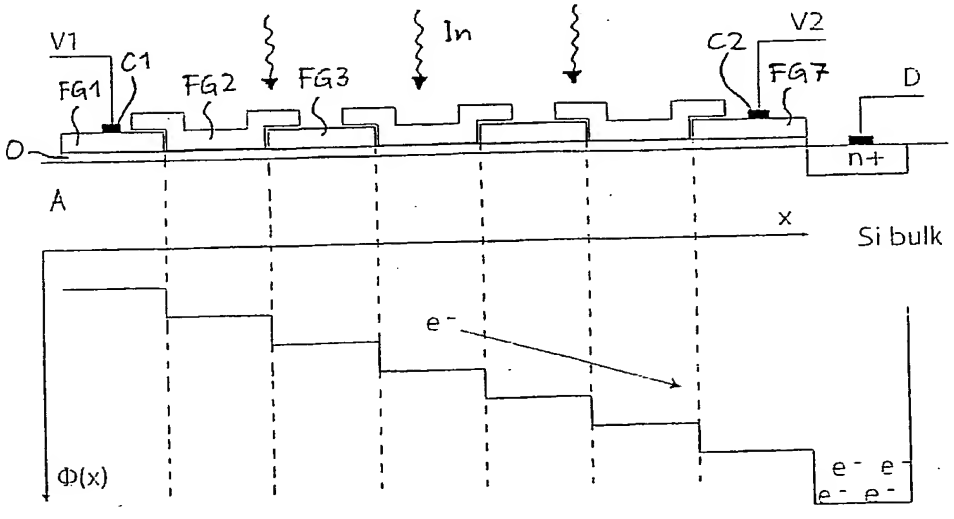
(54) Title: IMAGE SENSOR WITH LARGE-AREA, HIGH-SENSITIVITY AND HIGH-SPEED PIXELS



(57) Abstract: The pixel for use in an image sensor comprises a low-doped semiconductor substrate (A). On the substrate (A), an arrangement of a plurality of floating areas, e.g., floating gates (FG2-FG6), is provided. Neighboring floating gates are electrically isolated from each other yet capacitively coupled to each other. By applying a voltage (V2 - V1) to two contact areas (FG1, FG7), a lateral steplike electric field is generated. Photogenerated charge carriers move along the electric-field lines to the point of highest potential energy, where a floating diffusion (D) accumulate the photocharges. The charges accumulated in the various pixels are sequentially read out with a suitable circuit known from image-sensor literature, such as a source follower or a charge amplifier with row and column select mechanisms. The pixel of offers at the same time a large sensing area, a high photocharge-detection sensitivity and a high response speed, without any static current consumption.

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